### CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

1. A method of determining a capability of at least one communication facility to pass network layer protocol packets with a particular characteristic between a first network layer protocol process and a second network layer protocol process, the method comprising the steps of:

   detecting whether at least one first network layer protocol packet has been received, the at least one first network layer protocol packet comprising first information with the particular characteristic, the first information being capable of causing at least one filtering/forwarding entity not to pass the at least one first network layer protocol packet; and

   determining the capability of the at least one communication facility to pass the network layer protocol packets with the particular characteristic.

2. The method of claim 1, wherein, upon detecting that the at least one first network protocol packet has been received, the at least one communication facility is determined not to comprise the at least one filtering/forwarding entity and is determined to be capable of passing the network layer protocol packets with the particular characteristic.

3. The method of claim 1, wherein, upon detecting that the at least one first network protocol packet is no longer expected to be received, the at least one communication facility is determined to comprise the at least one filtering/forwarding entity and is determined not to be capable of passing the network layer protocol packets with the particular characteristic.

4. The method of claim 1, further comprising the step of:

transmitting at least one second network layer protocol packet comprising second information with the particular characteristic, the second information being capable of causing at least one filtering/forwarding entity not to pass the at least one second network layer protocol packet.

5. The method of claim 1, wherein the particular characteristic comprises a destination network layer address that is outside of a network address realm comprising network layer addresses of network layer protocol packets that would be forwarded by the at least one filtering/forwarding entity.

6. The method of claim 5, wherein the at least one filtering/forwarding entity is at least one network layer router that operates as a peer protocol layer entity to the at least one first network layer protocol process and the at least one second network layer protocol process.

7. The method of claim 6, wherein the at least one first network layer protocol process is an internet protocol (IP) process, wherein the at least one second network layer protocol process is an internet protocol (IP) process, and the at least one network layer router is at least one internet protocol (IP) router.

8. The method of claim 1, wherein the step of detecting whether at least one first network layer protocol packet has been received further comprises the step of:

receiving the at least one first network layer protocol packet.

9.    The method of claim 1, wherein the step of detecting whether at least one first network layer protocol packet has been received further comprises the step of:

determining that the at least one first network layer protocol process is not expected to be received.

10.    The method of claim 9, wherein the step of determining that the at least one first network layer protocol process is not expected to be received further comprises the steps of:

starting a timeout counter associated with transmitting at least one second network layer protocol packet;

detecting expiration of the timeout counter without having received the at least one first network layer protocol packet.

11.    The method of claim 9, wherein the step of determining that the at least one first network layer protocol process is not expected to be received further comprises the step of:

receiving a control message indicating that the at least one first network layer protocol packet was not passed through the at least one communication facilities.

12.    The method of claim 11, wherein the control message is an internet control message protocol (ICMP) message.

13.    The method of claim 12, wherein the ICMP message is at least one of: a destination unreachable message, a time exceeded message, a parameter problem message, a source-quench message, and a redirect message.

14.    The method of claim 1, wherein the first network protocol layer process is an internet protocol (IP) layer process.

1 15. The method of claim 1, wherein the second network protocol layer process is an
2   internet protocol (IP) layer process.

1 16. The method of claim 1, wherein the first network layer process and the second
2   network layer process are peer protocol layer entities.

1 17. The method of claim 1, wherein determining that the at least one communication
2   facility passes network layer protocol packets with the particular characteristic
3   implies that the at least one communication facility does not utilize routing at a
4   peer protocol layer to the first network layer process and the second network layer
5   process.

1 18. The method of claim 17, wherein the at least one communication facility provides
2   services below the first network protocol layer process and the second protocol
3   layer process that establish a one-to-one association between the first network
4   protocol layer process and the second network protocol layer process.

1 19. The method of claim 18, wherein the services provided by the network are
2   connection-oriented services that establish the one-to-one association.

1 20. The method of claim 19, wherein the connection-oriented services are circuit-
2   switching services.

1 21. The method of claim 19, wherein the connection-oriented services are connection-
2   oriented packet-switching services.

1 22. The method of claim 21, wherein the connection-oriented packet-switching
2   services are layer two services.

23. The method of claim 21, wherein each of the connection-oriented packet-switching services are: asynchronous transfer mode (ATM), frame relay, and X.25.

24. The method of claim 18, wherein the one-to-one association is established by a tunneling protocol that encapsulates the network protocol packets.

25. The method of claim 24, wherein the tunneling protocol provides a virtual private network (VPN).

26. The method of claim 24, wherein the tunneling protocol further comprises at least one: Generic Routing Encapsulation (GRE), Transmission Control Protocol (TCP), Secure IP (IPsec), Point-to-Point Tunneling Protocol (PPTP), Layer 2 Forwarding Protocol (L2F), Layer 2 Tunneling Protocol (L2TP), and Multi-Protocol Label Switching (MPLS).

27. The method of claim 1, wherein determining that the at least one communication facility does not pass network layer protocol packets with the particular characteristic implies that the network utilizes routing at a peer protocol layer to the first network layer process and the second network layer process.

28. The method of claim 27, wherein determining that the network utilizes routing implies that the network has at least a layer three network core.

29. A system to determine a capability of at least one communication facility to pass network layer protocol packets with a particular characteristic between a first network layer protocol process and a second network layer protocol process, the method comprising the steps of:

first logic configured to detect whether at least one first network layer protocol packet has been received, the at least one first network layer protocol packet comprising first information with the particular characteristic, the first information being capable of causing at least one filtering/forwarding entity to not pass the at least one first network layer protocol packet; and

second logic configured to determine the capability of the at least one communication facility to pass the network layer protocol packets with the particular characteristic.

30. The system of claim 29, wherein based at least upon the first logic detecting that the at least one first network protocol packet has been received, the at least one communication facility is determined not to comprise the at least one filtering/forwarding entity and is determined to be capable of passing the network layer protocol packets with the particular characteristic.

31. The system of claim 29, wherein based at least upon the first logic detecting that the at least one first network protocol packet is no longer expected to be received, the at least one communication facility is determined to comprise the at least one filtering/forwarding entity and is determined to not be capable of passing the network layer protocol packets with the particular characteristic.

32. The system of claim 29, further comprising the step of:

      logic configured to transmit at least one second network layer protocol packet comprising second information with the particular characteristic, the second information being capable of causing at least one filtering/forwarding entity to not pass the at least one second network layer protocol packet.

33. The system of claim 29, wherein the particular characteristic comprises a destination network layer address that is outside of a network address realm comprising network layer addresses of network layer protocol packets that would be forwarded by the at least one filtering/forwarding entity.

34. The system of claim 31, wherein the at least one filtering/forwarding entity is at least one network layer router that operates as a peer protocol layer entity to the at least one first network layer protocol process and the at least one second network layer protocol process.

35. The system of claim 32, wherein the at least one first network layer protocol process is an internet protocol (IP) process, wherein the at least one second network layer protocol process is an internet protocol (IP) process, and the at least one network layer router is at least one internet protocol (IP) router.